## IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

| In re A   | pplication  | on of:                                  | )                            |  |  |  |  |  |  |
|---|---|---|------------------------------|--|--|--|--|--|--|
| Kanji OHYAMA  |   |   | ) Confirmation No.: 1480     |  |  |  |  |  |  |
| Application No.: 10/584,082   |   |   | ) Group Art Unit: Unassigned |  |  |  |  |  |  |
| Filed:  | June 22   | 22, 2006 Examiner: Unassigned           |                              |  |  |  |  |  |  |
| For:  | MARCHANTIALES-DERIVED UNSATURATED FATTY ACID SYNTHETASE GENES AND USE OF THE SAME   |   |                              |  |  |  |  |  |  |
| Commissioner for Patents<br>U.S. Patent and Trademark Office<br>Customer Window Mail Stop: ☐ New Application ⊠ Amendment ☐ AF ☐ Issue Fee<br>Alexandria, VA 22314   |   |   |                              |  |  |  |  |  |  |
| Sir:  |   | INFORMATION DISCLOSUE                   | RE STATEMENT (IDS)           |  |  |  |  |  |  |
| he un<br>Action   | ☐ Under 37 C.F.R. § 1.97(b): Pursuant to 37 C.F.R. §§ 1.56 and 1.97(b), Applicant brings to the attention of the Examiner the documents listed on the attached PTO Form 1449. To he undersigned's knowledge, this IDS is being filed before the mailing date of a first Office Action on the merits, before the mailing date of a first Office Action on the merits after filing an ACE under § 1.114, or within three months of the application filing date. |   |                              |  |  |  |  |  |  |
| Under 37 C.F.R. § 1.97(c): Pursuant to 37 C.F.R. §§ 1.56 and 1.97(c), Applicant brings to the attention of the Examiner the documents listed on the attached PTO Form 1449. This IDS is being filed after the events recited in § 1.97(b) but, to the undersigned's knowledge, before the mailing date of a Final Office Action, a Notice of Allowance, or another action that closes prosecution in the application. |   |   |                              |  |  |  |  |  |  |
|   |   | The fee of \$180.00 set forth in § 1.17 | (p) is included herein; or   |  |  |  |  |  |  |
|   | Applicant submits that each item of information contained in this IDS was first cited in any communication from a foreign patent office in a counterpart foreign application not more than three months prior to the filing of this IDS.  |   |                              |  |  |  |  |  |  |
| Under 37 C.F.R. § 1.97(d): Pursuant to 37 C.F.R. §§ 1.56 and 1.97(d), Applicant or the attention of the Examiner the documents listed on the attached PTO Form 1449. This IDS is being filed after the events recited in § 1.97(c) but before payment of the issue fee.   |   |   |                              |  |  |  |  |  |  |
|   |   | The fee of \$180.00 set forth in § 1.17 | (p) is included herein; and  |  |  |  |  |  |  |
|   | Applicant submits that each item of information contained in this IDS was first cited in any communication from a foreign patent office in a counterpart foreign application not more than three months prior to the filing of this IDS.  |   |                              |  |  |  |  |  |  |

| Page 2  |
|---|
| Under 37 C.F.R. § 1.97(i): Pursuant to 37 C.F.R. §§ 1.56 and 1.97(i), Applicant brings to the attention of the Examiner the documents listed on the attached PTO Form 1449. This IDS is being filed after the events recited in § 1.97(d). Applicant requests that the IDS be placed in the file. |
| A search report or other listing of documents from a counterpart, related, or other application dated and having documents cited thereon is attached for the Examiner's consideration. Any of these documents not previously cited, and any additional documents are listed on the PTO Form 1449. |
| Applicant respectfully requests that the Examiner consider the listed documents and   |

Applicant respectfully requests that the Examiner consider the listed documents and evidence that consideration by making appropriate notations on the attached form. As for any document listed on the accompanying PTO-1449 that is in a language other than English, relevance can be understood from an enclosed English abstract or at least partial translation or from mention in the specification or in a search report for a corresponding application.

This submission does not represent that a search has been made or that no better art exists and does not constitute an admission that any of the listed documents are material or constitute "prior art." If it should be determined that any of the listed documents do not constitute "prior art" under United States law, Applicant reserve the right to present to the Office the relevant facts and law regarding the appropriate status of such documents.

Applicant further reserves the right to take appropriate action to establish the patentability of the disclosed invention over the listed documents, should any of the documents be applied against the claims of the present application.

Except for issue fees payable under 37 C.F.R. § 1.18, the Commissioner is hereby authorized by this paper to charge any additional fees during the entire pendency of this Application, including fees due under 37 C.F.R. § 1.16 and 1.17 which may be required and including any required extension of time fees, or credit any overpayment to Deposit Account No. 50-0573. This paragraph is intended to be a CONSTRUCTIVE PETITION FOR EXTENSION OF TIME in accordance with 37 C.F.R. § 1.136(a)(3).

Respectfully submitted,

DRINKER, BODDLE & REATH LL

Dated: May 15, 2007

CUSTOMER NO. 055694
DRINKER, BIDDLE & REATH LLP
1500 K Street, N.W., Suite 1100
Washington, D.C. 20005-1209
Tel: 202.842.8800: Fax: 202.842.8465

DC\601814\1

Receipt date: 05/15/2007

| INFORM                                 |  | Attorney Docket No.:<br>47236-0009  |  |  |   | Serial No.:  |  |  |  |
|--|--|---|--|--|---|--|--|--|--|
| INFORM                                 |  |   |  |  | 10/584,082  |  |  |  |  |
| (U                                     | Applican<br>Kanji OH   | YAMA  |  |  | e 1 of 4  |  |  |  |  |
|  | PTO Form 1449  | Filing Da   |  |  | Gro   | up Art Uni   | t:   |  |  |
|  | June 22, 2   | 2006  |  | Una  | ssigned   |  |  |  |  |
|  | U.S. PA  | TENT DOCUM  | ENTS   |  |   |  |  |  |  |
| *Examiner                              | Document   |   | Name CI  |  |   | lass Class   |  |  |  |
| Initial                                | Number   | Date  |  |  | Class   |  |  | g Date   |  |
|  |  |   |  | -+   |   | -  | -  |  |  |
| ······································ | FOREIGN  | PATENT DOC  | UMENTS   |  |   |  |  |  |  |
|  | Document   |   |  |  | Sub   | Sub <u>Translation</u>   |  |  |  |
|  | Number   | Date  | Country  | Class  | Class   | · YE   | YES  |  |  |
|  | :  |   |  |  | <del> </del>  | <del>                                     </del>   |  | -  |  |
|  |  | ER DOCUMEN  |  |  |   |  |  |  |  |
|  | the author (in CAPITAL LETTERS),   |   |  |  |   |  |  |  |  |
| ournal, serial, syr                    | nposium, catalog, etc.) date, page(s), ve  |   |  |  |   |  |  |  |  |
| /E.M./                                 | Y. FUJINO, "Introduction to Lip  |   |  |  |   |  | , Gak  | kaı  |  |
| 1                                      | Shuppan Center, pp. 42-46, pp. 1 A. YAMADA, "Experimental M  |   |  |  |   |  |  | 1  |  |
|  |  |   |  |  |   |  | ntai ivi   | etnoa  |  |
|  | 24," Gakkai Shuppan Center, pp. 2-9, and its partial English-language translation. F. DOMERGUE et al., "Cloning and functional characterization of Phaeodactylum tricornutum front-en  |   |  |  |   |  |  |  |  |
|  | F. DOMERGUE et al., "Cloning and functional characterization of <i>Phaeodactylum tricornutum</i> front-en desaturases involved in eicosapentaenoic acid biosynthesis," Eur. J. Biochem., 2002, Vol. 269, pp. 4105-   |   |  |  |   |  |  |  |  |
|  | 4113.  |   |  |  |   |  |  |  |  |
|  |  |   |  |  |   |  |  |  |  |
|  | O. SAYANOVA et al., "Express   |   |  |  |   |  |  |  |  |
|  | O. SAYANOVA et al., "Express<br>b <sub>5</sub> domain results in the accumula  | ation of high leve  | ls of Δ6-des   | saturated  |   |  |  |  |  |
|  | O. SAYANOVA et al., "Express<br>b <sub>5</sub> domain results in the accumula<br>Proc. Natl. Acad. Sci. USA, Apri  | ation of high leve<br>il 1997, Vol. 94,   | ls of Δ <sup>6</sup> -des  | saturated<br>16.   | fatty acid  | s in transge   | nic tob  | acco,  |  |
|  | O. SAYANOVA et al., "Express<br>b <sub>5</sub> domain results in the accumule<br>Proc. Natl. Acad. Sci. USA, Apri<br>F. GARCÍA-MAROTO et al., "C   | ation of high leve<br>il 1997, Vol. 94,<br>Cloning and Mole   | els of Δ <sup>6</sup> -des<br>pp. 4211-42<br>cular Chara   | saturated<br>16.<br>cterizatio   | fatty acid  | s in transge   | nic tob<br>ase from  | n Two  |  |
|  | O. SAYANOVA et al., "Express<br>b, domain results in the accumul<br>Proc. Natl. Acad. Sci. USA, Apri<br>F. GARCÍA-MAROTO et al., "<br>Echium Plant Species: Productic  | ation of high leve<br>il 1997, Vol. 94,<br>Cloning and Mole<br>on of GLA by He  | els of Δ <sup>6</sup> -des<br>pp. 4211-42<br>cular Chara   | saturated<br>16.<br>cterizatio   | fatty acid  | s in transge   | nic tob<br>ase from  | n Two  |  |
|  | O. SAYANOVA et al., "Express b3 domain results in the accumule Proc. Natl. Acad. Sci. USA, Apri F. GARCÍA-MAROTO et al., "C Echium Plant Species: Productic 2002, Vol. 37, No. 4, pp. 417-42:  | ation of high leve<br>il 1997, Vol. 94,<br>Cloning and Mole<br>on of GLA by He<br>6.  | els of Δ <sup>6</sup> -des<br>pp. 4211-42<br>cular Chara<br>terologous I   | saturated<br>16.<br>cterizatio<br>Expressio  | fatty acid<br>on of the Z<br>on in Yeas   | s in transge<br>M6-Desatura<br>t and Toba  | enic tob<br>ase from<br>cco," I  | n Two  |  |
|  | O. SAYANOVA et al., "Express<br>b, domain results in the accumul<br>Proc. Natl. Acad. Sci. USA, Apri<br>F. GARCÍA-MAROTO et al., "<br>Echium Plant Species: Productic  | ation of high leve<br>il 1997, Vol. 94, Cloning and Mole<br>on of GLA by He<br>6.<br>cation of <i>Primula</i>   | els of Δ <sup>6</sup> -des<br>pp. 4211-42<br>cular Chara<br>terologous I   | saturated<br>16.<br>cterizatio<br>Expressio  | fatty acid<br>on of the Z<br>on in Yeas   | s in transge<br>M6-Desatura<br>t and Toba  | enic tob<br>ase from<br>cco," I  | n Two  |  |
|  | O. SAYANOVA et al., "Express by domain results in the accumula Proc. Natl. Acad. Sci. USA, Aprif. GARCIA-MAROTO et al., "C Echium Plant Species: Productic 2002, Vol. 37, No. 4, pp. 417-42. O. SAYANOVA et al., "Identific Preferences", "FEBS Letters, 200 H. WHITNEY et al., "Functional  | ation of high lever<br>il 1997, Vol. 94,<br>Cloning and Mole<br>on of GLA by He<br>6.<br>cation of <i>Primula</i><br>13, Vol. 542, pp.<br>I characterisation  | els of Δ <sup>6</sup> -des<br>pp. 4211-42<br>cular Chara<br>terologous I<br>fatty acid Δ<br>100-104.<br>of two cyto  | saturated<br>216.<br>ecterization<br>Expression<br>\(^6\)-desaturation   | fatty acid<br>on of the A<br>on in Yeas<br>rases with   | M6-Desaturate and Toba   | ase from   | n Two  |  |
|  | O. SAYANOVA et al., "Express b; domain results in the accumul Proc. Natl. Acad. Sci. USA, Apri F. GARCÍA-MAROTO et al., "Echium Plant Species: Productic 2002, Vol. 37, No. 4, pp. 417-42 O. SAYANOVA et al., "Identific preferences!," FEBS Letters, 200 H. WHITNEY et al., "Functional Anemone leveillet: the unexpecte unexpected to the preferences of the complex of the  | ation of high lever<br>il 1997, Vol. 94,<br>Cloning and Mole<br>on of GLA by He<br>6.<br>cation of <i>Primula</i><br>13, Vol. 542, pp.<br>I characterisation  | els of Δ <sup>6</sup> -des<br>pp. 4211-42<br>cular Chara<br>terologous I<br>fatty acid Δ<br>100-104.<br>of two cyto  | saturated<br>216.<br>ecterization<br>Expression<br>\(^6\)-desaturation   | fatty acid<br>on of the A<br>on in Yeas<br>rases with   | M6-Desaturate and Toba   | ase from   | n Two  |  |
|  | O. SAYANOVA et al., "Express by domain results in the accumble Proc. Natl. Acad. Sci. USA, Apri F. GARCIA-MAROTO et al., "Echium Plant Species: Productic 2002, Vol. 37, No. 4, pp. 417-42. O. SAYANOVA et al., "Identific preferences," FEBS Letters, 2002. H. WHITNEY et al., "Functional Anemone leveillei: the unexpecte 217, pp. 983-992.   | ation of high leve<br>il 1997, Vol. 94, j<br>Cloning and Mole<br>on of GLA by He<br>6.<br>cation of <i>Primula</i><br>33, Vol. 542, pp.<br>characterisation<br>d identification of  | els of $\Delta^6$ -des<br>pp. 4211-42<br>cular Chara<br>terologous l<br>fatty acid $A$<br>100-104.<br>of two cyto<br>if a fatty aci  | saturated 216. cterizatio Expressio  \(^6\)-desatur  ochrome i  d \(^6\)-desa  | fatty acid<br>on of the Z<br>on in Yeas<br>rases with<br>b <sub>3</sub> -fusion of<br>aturase," I   | s in transge  Mo-Desatura  and Toba  n-3 substra  desaturases  Planta, July  | ase from   | m Two  |  |
|  | O. SAYANOVA et al., "Express b <sub>3</sub> domain results in the accumul Proc. Natl. Acad. Sci. USA, Apri F. GARCIA-MAROTO et al., "Chehium Plant Species: Productic 2002, Vol. 37, No. 4, pp. 417-42 O. SAYANOVA et al., "Identific preferences!" FEBS Letters, 2004 H. WHITNEY et al., "Functional Anemone leveillei: the unexpecte 217, pp. 983-992. Y. HUANG et al., "Cloning of Δ  | ation of high leve<br>il 1997, Vol. 94,<br>Cloning and Mole<br>on of GLA by He<br>6.<br>cation of <i>Primula</i><br>33, Vol. 542, pp.<br>characterisation<br>d identification of  | els of $\Delta^6$ -des<br>pp. 4211-42<br>cular Chara<br>terologous l<br>fatty acid $\Delta$<br>100-104.<br>of two cyto<br>of a fatty aci   | saturated 216. 216. Expression A <sup>6</sup> -desaturated achrome to the disconnection and the disconnection are disconn  | fatty acid<br>on of the Zon in Yeas<br>rases with<br>05-fusion of<br>aturase," I  | S in transge  Mo-Desatura  and Toba  n-3 substra  desaturases  Planta, July  a and Reco  | ase from cco," I ate   | m Two  |  |
|  | O. SAYANOVA et al., "Express by domain results in the accumula Proc. Natl. Acad. Sci. USA, Apri F. GARCIA-MAROTO et al., "Echium Plant Species: Productic 2002, Vol. 37, No. 4, pp. 417-42. O. SAYANOVA et al., "Identify preferences," FEBS Letters, 200 H. WHITNEY et al., "Functional Anemone leveillei: the unexpecte 217, pp. 983-992. Y. HUANG et al., "Cloning of A Production of y-Linolenic Acid in   | ation of high leve<br>il 1997, Vol. 94, il<br>Cloning and Mole<br>Coning and Mole<br>on of GLA by He<br>6.<br>cation of Primula<br>3, Vol. 542, pp.<br>characterisation<br>d identification of<br>12- and \( \Delta \)6-Desa<br>in Saccharomyces  | els of $\Delta^6$ -despp. 4211-42 cular Chara terologous la fatty acid $\Delta$ 100-104. of two cyto of a fatty aci turases from a cerevisiae,   | saturated et 16. Incterization Expression $\Delta^6$ -desaturated $\Delta^6$ -   | fatty acid<br>on of the 2<br>on in Yeas<br>rases with<br>b <sub>5</sub> -fusion of<br>aturase," I<br>rella alpin<br>1999, Vo  | Modern transge to the control of the | ase from 24, 20 ombina   | n Two  |  |
|  | O. SAYANOVA et al., "Express by domain results in the accumule Proc. Natl. Acad. Sci. USA, Apri F. GARCIA-MAROTO et al., "Echium Plant Species: Productic 2002, Vol. 37, No. 4, pp. 417-42. O. SAYANOVA et al., "Identific preferences," FEBS Letters, 2001 H. WHITNEY et al., "Functional Anemone leveillei: the unexpecte 217, pp. 933-992. Y. HUANG et al., "Cloning of A. Production of y-Linolenic Acid in E. SAKURADANI et al., "A6-Fa   | ation of high leve<br>il 1997, Vol. 94,<br>Icloning and Mole<br>on of GLA by He<br>6.<br>cation of Primula<br>13, Vol. 542, pp.<br>characterisation<br>d identification of<br>112- and &-Desa<br>n Saccharomyces<br>tty acid desatura   | els of $\Delta^6$ -despp. 4211-42 ecular Chara terologous la fatty acid $\Delta$ 100-104. of two cytof a fatty aci turases from an a   | saturated et 16. Interization Expression A <sup>6</sup> -desaturated to A <sup>6</sup> -desaturated A <sup>6</sup> -desatura | fatty acid on of the L on in Yeas rases with the fatty acid attraces," I rella alpin 1999, Vo tic acid-pr   | Modern transge to the control of the | ase from 24, 20 ombina for the fortiere                                | oacco,<br>m Twe<br>ipids,<br>03, V                                 |  |
|  | O. SAYANOVA et al., "Express b; domain results in the accumul Proc. Natl. Acad. Sci. USA, Apri F. GARCIA-MAROTO et al., "Echium Plant Species: Productic 2002, Vol. 37, No. 4, pp. 417-42 O. SAYANOVA et al., "Identific preferences!," FEBS Letters, 200 H. WHITNEY et al., "Functional Anemone leveille: the unexpecte 217, pp. 983-992. V. HUANG et al., "Cloning of A Production of y-Linolenic Acid in E. SAKURADANI et al., "A6-Fa fungus Gene cloning and its hete  | ation of high leve<br>il 1997, Vol. 94,<br>Icloning and Mole<br>on of GLA by He<br>6.<br>cation of Primula<br>13, Vol. 542, pp.<br>characterisation<br>d identification of<br>112- and &-Desa<br>n Saccharomyces<br>tty acid desatura   | els of $\Delta^6$ -despp. 4211-42 ecular Chara terologous la fatty acid $\Delta$ 100-104. of two cytof a fatty aci turases from an a   | saturated et 16. Interization Expression A <sup>6</sup> -desaturated to A <sup>6</sup> -desaturated A <sup>6</sup> -desatura | fatty acid on of the L on in Yeas rases with the fatty acid attrace, "I rella alpin 1999, Vo tic acid-pr  | Modern transge to the control of the | ase from 24, 20 ombina for the fortiere                                | m Two<br>ipids,<br>03, Vont<br>49-65                               |  |
|  | O. SAYANOVA et al., "Express by domain results in the accumule Proc. Natl. Acad. Sci. USA, Apri F. GARCIA-MAROTO et al., "Echium Plant Species: Productic 2002, Vol. 37, No. 4, pp. 417-42. O. SAYANOVA et al., "Identific preferences," FEBS Letters, 2001 H. WHITNEY et al., "Functional Anemone leveillei: the unexpecte 217, pp. 933-992. Y. HUANG et al., "Cloning of A. Production of y-Linolenic Acid in E. SAKURADANI et al., "A6-Fa   | ation of high level in 1997, Vol. 94, Cloning and Mole on of GLA by He 6. cation of Primula 13, Vol. 542, pp. characterisation of identification of 112- and &6-Desa on Saccharomyces thy acid desatura rologous express  | els of $\Delta^6$ -despp. 4211-42 cular Chara terologous l'atty acid $\Delta$ 100-104. of two cytof a fatty aci turases from an acion in a fun   | saturated et 16. Acterization Expression Acterization Act   | fatty acid on of the 2 on in Yeas rases with 05-fusion of aturase," I rella alpin 1999, Vo iic acid-pr regillus,"   | s in transge<br>M6-Desaturat<br>t and Toba<br>n-3 substra-<br>desaturases<br>Planta, July<br>a and Reco<br>1. 34, No. 7<br>oducing M<br>Gene, Augu   | ase from 24, 20 ombina 7, pp. 6 fortiere just 6, 1                     | oacco,<br>m Two<br>Lipids,<br>03, V<br>ont<br>49-65<br>lla<br>999, |  |
|  | O. SAYANOVA et al., "Express by domain results in the accumula Proc. Natl. Acad. Sci. USA, Apri F. GARCIA-MAROTO et al., "Exhium Plant Species: Productic 2002, Vol. 37, No. 4, pp. 417-42. O. SAYANOVA et al., "Identific preferences," FEBS Letters, 200 H. WHITNEY et al., "Functional Anemone leveillei: the unexpecte 217, pp. 983-992. Y. HUANG et al., "Cloning of A Production of y-Linolenic Acid in E. SAKURADANI et al., "A6-fingus Gene cloning and its hete Vol. 238, pp. 445-453. J. NAPIER et al., "Identification expression in Saccharomyces cere   | ation of high leveil 1997, Vol. 94, 12 loning and Mole on of GLA by He 6. ation of Primula 3, Vol. 542, pp. 1 characterisation of identification of identification of 12- and Δ6-Desa in Saccharomyces itty acid desatura rologous express of a Caenorhaba evisiae," Bioche evisiae," Bioche        | els of Δ <sup>6</sup> -des<br>pp. 4211-42<br>cular Chara<br>terologous l<br>fatty acid 2<br>100-104.<br>of two cyto<br>of a fatty aci<br>turases from<br>a cerevisiae,<br>se from an<br>ion in a fun,<br>littis elegans<br>m. J., 1998,  | saturated c16. ccterization cc  | fatty acid on of the \( \text{\ell} \) on in Yeas rases with 0;-fusion of the rase; "I rella alpin 1999, Vo tic acid-pregillus," ( acid-desa to pp. 611-  | s in transge  M6-Desaturat  and Toba  m-3 substra  desaturases  Planta, July  a and Reco  1. 34, No. 7  oducing M  Gene, Augu  turase by h  614.   | ase from 24, 20 ombina 1, pp. 6 ortiere ust 6, 1                       | m Two  |  |
|  | O. SAYANOVA et al., "Express bs domain results in the accumul Proc. Natl. Acad. Sci. USA, Apri F. GARCIA-MAROTO et al., "Chehium Plant Species: Productic 2002, Vol. 37, No. 4, pp. 417-42 O. SAYANOVA et al., "Identific preferences", "FEBS Letters, 200 H. WHITNEY et al., "Functional Anemone leveillet: the unexpecte 217, pp. 983-992. Y. HUANOG et al., "Cloning of Δ Production of γ-Linolenic Acid in E. SAKURADANI et al., "Δ6-Fa fungus Gene cloning and its hete-Vol. 238, pp. 445-453. J. NAPIER et al., "Identification  | ation of high leveil 1997, Vol. 94, 12 loning and Mole on of GLA by He 6. ation of Primula 3, Vol. 542, pp. 1 characterisation of identification of identification of 12- and Δ6-Desa in Saccharomyces itty acid desatura rologous express of a Caenorhaba evisiae," Bioche evisiae," Bioche        | els of Δ <sup>6</sup> -des<br>pp. 4211-42<br>cular Chara<br>terologous l<br>fatty acid 2<br>100-104.<br>of two cyto<br>of a fatty aci<br>turases from<br>a cerevisiae,<br>se from an<br>ion in a fun,<br>littis elegans<br>m. J., 1998,  | saturated c16. ccterization cc  | fatty acid on of the \( \text{\ell} \) on in Yeas rases with 0;-fusion of the rase; "I rella alpin 1999, Vo tic acid-pregillus," ( acid-desa to pp. 611-  | s in transge  M6-Desaturat  and Toba  m-3 substra  desaturases  Planta, July  a and Reco  1. 34, No. 7  oducing M  Gene, Augu  turase by h  614.   | ase from 24, 20 ombina 1, pp. 6 ortiere ust 6, 1                       | m Twe<br>ipids,<br>03, Vont<br>49-65:                              |  |
| \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \  | O. SAYANOVA et al., "Express by domain results in the accumul Proc. Natl. Acad. Sci. USA, Apri F. GARCIA-MAROTO et al., "Express Productic 2002, Vol. 37, No. 4, pp. 417-42 O. SAYANOVA et al., "Identific preferences!," FEBS Letters, 200 H. WHITNEY et al., "Functional Anemone leveille: the unexpecte 217, pp. 983-992. V. HUANG et al., "Cloning of A Production of y-Linolenic Acid in E. SAKURADANI et al., "A6-Fa fungus Gene cloning and its hete Vol. 238, pp. 445-453. J. NAPIER et al., "Identification expression in Saccharomyces cer A. REDDY et al., "Isolation of a PCC 6803 by gain-of-function con the control of the con | ation of high Ieve<br>il 1997, Vol. 94,<br>Cloning and Mole<br>on of GLA by He<br>6.<br>cation of Primula<br>13, Vol. 542, pp.<br>claractic of Primula<br>13, Vol. 542, pp.<br>12- and AG-Desa<br>on Saccharomyces<br>tity acid desatura<br>rologous express<br>of a Caenorhaba<br>evisiae," Bioche | els of Δ <sup>6</sup> -des<br>pp. 4211-42<br>cular Chara-<br>terologous l<br>fatty acid 2<br>100-104.<br>of two cyto<br>of a fatty aci<br>turases from<br>a cerevisiae,<br>se from an a<br>ion in a fun,<br>littis elegans<br>m. J., 1998,<br>ne from the                        | saturated c16. ccterizatic Expression $\Delta^6$ -desaturated $\Delta^6$ -desaturated $\Delta^6$ -desaturated $\Delta^6$ -desaturated $\Delta^6$ -desaturated $\Delta^6$ -desaturated $\Delta^6$ -fatty-Vol. 330 cyanoba   | fatty acid on of the \( \text{\partial} \) on in Yeas rases with \( \text{\partial} \) on in Yeas rases rases with \( \text{\partial} \) on in Yeas rases | s in transge  Mo-Desaturat t and Toba  m-3 substra desaturases Planta, July a and Reco l. 34, No. 7 Gene, Aug turase by h 614. ynechocyst.   | ase from 24, 20 ombina 7, pp. 6 ortiere ast 6, 1 oeterolo is sp. S     | m Two  |  |
| aminer                                 | O. SAYANOVA et al., "Express b <sub>3</sub> domain results in the accumul Proc. Natl. Acad. Sci. USA, Apri F. GARCIA-MAROTO et al., "C. Echium Plant Species: Productic 2002, Vol. 37, No. 4, pp. 417-42 O. SAYANOVA et al., "Identific preferences!" FEBS Letters, 200 H. WHITNEY et al., "Functional Anemone leveillei: the unexpecte 217, pp. 983-992. Y. HUANG et al., "Cloning of Δ Production of γ-Linolenic Acid in E. SAKURA DANI et al., "do-Fa fungus Gene cloning and its hete Vol. 238, pp. 445-433. J. NAPIER et al., "Identification expression in Saccharomyces cere A. REDDY et al., "Isolation of a   | ation of high Ieve<br>il 1997, Vol. 94,<br>Cloning and Mole<br>on of GLA by He<br>6.<br>cation of Primula<br>13, Vol. 542, pp.<br>claractic of Primula<br>13, Vol. 542, pp.<br>12- and AG-Desa<br>on Saccharomyces<br>tity acid desatura<br>rologous express<br>of a Caenorhaba<br>evisiae," Bioche | els of Δ <sup>6</sup> -det<br>pp. 4211-42<br>pp. 4211-42<br>cular Characterologous<br>fatty acid Δ<br>100-104.<br>of two cyto<br>f a fatty aci<br>turases from<br>turases from<br>turases from<br>to in a fun,<br>littis elegans<br>m. J., 1998,<br>ne from the<br>hadena sp. St | saturated c16. ccterizatic Expression $\Delta^6$ -desaturated $\Delta^6$ -desaturated $\Delta^6$ -desaturated $\Delta^6$ -desaturated $\Delta^6$ -desaturated $\Delta^6$ -desaturated $\Delta^6$ -fatty-Vol. 330 cyanoba   | fatty acid on of the Lon in Yeas rases with by-fusion of atturase," I sella alpin 1999, Voice acid-pergillus," (acid-desa, pp. 611-cterium S. 7120," P  | s in transge  Mo-Desaturat t and Toba  m-3 substra desaturases Planta, July a and Reco l. 34, No. 7 Gene, Aug turase by h 614. ynechocyst.   | ase from 24, 20 mbina di si sp. S. | m Two  |  |

|                      | ATION DISCLOSURE CITATION   | 47236-00                      | Attorney Docket No.:<br>47236-0009 |                       |                               |                               | Serial No.:<br>10/584,082 |          |  |
|----------------------|---|-------------------------------|------------------------------------|-----------------------|-------------------------------|-------------------------------|---------------------------|----------|--|
| (U                   | se several sheets if necessary) PTO Form 1449   | Kanji OH                      | Applicant<br>Kanji OHYAMA          |                       |                               |                               | Page 2 of 4               |          |  |
|                      |   | Filing Date:<br>June 22, 2006 |                                    |                       | Group Art Unit:<br>Unassigned |                               |                           |          |  |
|                      | U.S. PA   | TENT DOCUM                    | ENTS                               |                       |                               |                               |                           |          |  |
| *Examiner            | Document  | _                             |                                    |                       |                               | Sub                           |                           |          |  |
| Initial              | Number  | Date                          | Date Name C                        |                       |                               | s Class Filing                |                           | g Date   |  |
|                      | FOREIGN   | PATENT DOC                    | UMENTS                             |                       |                               |                               |                           |          |  |
|                      | Document  |                               |                                    | l                     | Sub                           |                               |                           | islation |  |
|                      | Number  | Date                          | Country                            | Class                 | Class                         | YE                            | YES NO                    |          |  |
|                      |   |                               |                                    |                       |                               |                               |                           |          |  |
| journal, serial, syr | <ul> <li>fthe author (in CAPITAL LETTERS), title of the article (when appropriate), title of the item (book, magazine, mposium, catalog, etc.) date, page(s), volume-issue number(s), publisher, city and/or country where published.)</li> <li>T. AKI et al., "Molecular Cloning and Functional Characterization of Rat Δ-6 Fatry Acid Desaturase," Biochemical and Biophysical Research Communications, 1999, Vol. 255, No. 3, pp. 575-579.</li> <li>H. CHO et al., "Cloning, Expression, and Nutritional Regulation of the Mammalian Δ-6 Desaturase," The Journal of Biological Chemistry, January 1, 1999, Vol. 274, No. 1, pp. 471-477.</li> <li>J. PARKER-BARNES et al., "Identification and characterization of an enzyme involved in the elongation of n-6 and n-3 polyunsaturated fatty acids," PNAS, July 18, 2000, Vol. 97, No. 15, pp. 8284-8289.</li> <li>F. BEAUDOIN et al., "Heterologous reconstitution in yeast of the polyunsaturated fatty acid biosynthetic pathway," PNAS, June 6, 2000, Vol. 97, No. 12, pp. 6421-6426.</li> <li>T. ZANK et al., "Cloning and functional characterization of an enzyme involved in the elongation of Δopolyunsaturated fatty acids from the moss Physcomitrella patens," The Plant Journal, 2002, Vol. 31, No. 3, pp. 255-268.</li> <li>C. OH et al., "ELO2 and ELO3, Homologues of the Saccharomyces cerevisiae ELO1 Gene, Function in Fatty Acid Elongation and Are Required for Sphingolipid Formation," The Journal of Biological Chemistry, July 11, 1997, Vol. 272, No. 28, pp. 1737-617384.</li> </ul> |                               |                                    |                       |                               |                               |                           |          |  |
|                      | <ul> <li>D. JAMES, JR. et al., "Directed Tagging of the Arabidopsis FATTY ACID ELDNGATIONI (FAEI) Gene with the Maize Transposon Activator," The Plant Cell, March 1995, Vol. 7, pp. 309-319.</li> <li>D. KNUTZON et al., "Identification of Δ5-Desaturase from Mortierella alpina by Heterologous Expression in Bakers' Yeast and Canola," The Journal of Biological Chemistry, November 6, 1998, Vol. 273, No. 45, pp. 2936-029366.</li> <li>L. MICHAELSON et al., "Functional identification of a fatty acid Δ³ desaturase gene from Cannorhabditis elegons," PEBS Letters, 1998, Vol. 439, pp. 215-218.</li> <li>R. ZOLF AGHARI et al., "Fatty Acid Δ²-Desaturase mRNA is Regulated by Dietary Vitamin A and Exogenous Retinoic Acid in Liver of Adult Rats¹," Archives of Biochemistry and Biophysics, July 1, 2001, Vol. 391, No. 1, pp. 8-15.</li> <li>H. CHO et al., "Cloning, Expression, and Fatty Acid Regulation of the Human Δ-5 Desaturase," The</li> </ul>   |                               |                                    |                       |                               |                               |                           |          |  |
| Examiner             | Journal of Biological Chemistry, /Elizabeth Mcelwain/   | December 24, 19               |                                    | 4, No. 52<br>Date Cor |                               | 5-3 <b>7339.</b><br>06/17/201 | 0                         |          |  |
|                      | reference considered, whether or not conformance and not considered. Includ   |                               |                                    |                       |                               |                               | gh cita                   | tion if  |  |

Receipt date: 05/15/2007

|                     | Attorney Docket No.:  |   |                                       |               | Serial No.: |                  |          |              |  |
|---------------------|---|---|---------------------------------------|---------------|-------------|------------------|----------|--------------|--|
| INFORMA             | ATION DISCLOSURE CITATION   | 47236-0   | 009                                   |               | 10/         | 584,082          |          |              |  |
| (Us                 | Applicant<br>Kanji OHYAMA   |   |                                       | Pag           | Page 3 of 4 |                  |          |              |  |
|                     | PTO Form 1449   | Filing D  |                                       |               | Gro         | up Art Uni       | t:       |              |  |
|                     | 4   | June 22,  | 2006                                  |               | Un          | assigned         |          |              |  |
|                     | U.S. PATE   | NT DOCU   | MENTS                                 |               |             |                  |          |              |  |
| *Examiner           | Document  |   |                                       |               |             | Sub              |          |              |  |
| Initial             | Number  | Date  | Nam                                   | Name Cla      |             | ass Class        |          | Filing Date  |  |
|                     |   |   |                                       |               |             |                  |          |              |  |
|                     | FOREIGNA  | merum boo   | WIDANDAMO.                            |               |             | L                |          |              |  |
|                     | FOREIGN PA  | CTENT DO  | UMENTS                                |               | Sub         | т                |          |              |  |
|                     | Number  | Date  | Country                               | Class         | Class       | Translati<br>YES |          | on<br>NO     |  |
|                     | Trumber   | Duic  | Country                               | Ciuss         | Ciass       | 1.0              |          | 110          |  |
|                     |   |   |                                       |               |             |                  |          |              |  |
|                     |   | R DOCUME  |                                       |               |             |                  |          |              |  |
| (Include name of    | the author (in CAPITAL LETTERS), title  | e of the artic  | e (when appi                          | ropriate),    | title of th | e item (boc      | k, mag   | azine,       |  |
| ournal, serial, sym | nposium, catalog, etc.) date, page(s), volu   | me-issue nur  | nber(s), publ                         | isher, city   | and/or o    | ountry whe       | re pub   | lished.)     |  |
|                     | F. DOMERGUE et al., "Acyl Carrie  |   |                                       |               |             |                  |          |              |  |
| /E.M./              | Very Long-chain Polyunsaturated F   |   |                                       |               |             |                  | ournal   | of           |  |
|                     | Biological Chemistry, September 12  |   |                                       |               |             |                  |          |              |  |
|                     |   | A et al., "Functional Analysis of a β-Ketoacyl-CoA Synthase Gene, MpFAE2, by Gene |                                       |               |             |                  |          |              |  |
|                     | Silencing in the Liverwort Marchan  | itia polymorį   | ha L.," Bios                          | ci. Biotec    | hnol. Bio   | chem., 200       | 3, Vol.  | 67,          |  |
|                     | No. 3, pp. 605-612.  M. KAJIKAWA et al., "MpFAE3, a   | 0.17  | 0.10.4                                |               |             |                  |          |              |  |
|                     | polymorpha L., is Preferentially Inv  |   |                                       |               |             |                  |          |              |  |
|                     | Biotechnol. Biochem., 2003, Vol. 6  |   |                                       | illillitic Ac | ia to Ste   | iric Acid,       | BIOSCI.  |              |  |
|                     | V. DEMBITSKY, "Lipids of Bryop  |   |                                       | 1993. Vo      | l. 32. No   | 3. pp. 281-      | 356.     |              |  |
|                     | T. HASHIMOTO-GOTOH et al., "  |   |                                       |               |             |                  |          | cita         |  |
|                     | directed mutagenesis," Gene, 1995,  |   |                                       | nuc-unec      | ieu uuai a  | mioer meur       | ou 101 : | site-        |  |
|                     | L. ZHANG et al., "Gene Expression   |   |                                       | ancer Ce      | lls " Scie  | nce May 2        | 3 100    | 7 Vol        |  |
|                     | 276, pp. 1268-1272.   |   | · · · · · · · · · · · · · · · · · · · | Junioci Co    | no, oci     | nec, may 2       | 5, 177   | ,, , , , , , |  |
|                     | V. VELCULESCU et al., "Characterization of the Yeast Transcriptome," Cell, January 24, 1997, Vi           |   |                                       |               |             |                  |          | Vol. 88      |  |
|                     | pp. 243-251.  |   |                                       | -             |             | •                |          |              |  |
|                     | V. VELCULESCU et al., "Serial A   | nalysis of Ge   | ne Expressio                          | n," Scien     | ce, Octob   | er 20, 1995      | , Vol.   | 270, pr      |  |
|                     | 484-487.  |   |                                       |               |             |                  |          |              |  |
|                     | K. POLYAK et al., "A model for p53-induced apoptosis," Nature, September 18, 1997, Vol. 389, pp. 300-305. |   |                                       |               |             |                  |          |              |  |
|                     | M. FUJISAWA et al., "Isolation of   | X and Y Chr   | omosome-Sp                            | ecific Di     | NA Mark     | ers from a I     | iverw    | ort,         |  |
|                     | Marchantia polymorpha, by Representational Difference Analysis," Genetics, November 2001, Vol.            |   |                                       |               |             |                  |          |              |  |
|                     | pp. 981-985.  |   |                                       |               |             |                  |          |              |  |
|                     | I. MITSUHARA et al., "Efficient P   | romoter Cass  | ettes for Enh                         | anced Ex      | pression    | of Foreign       | Genes    | in           |  |
| \\/ \               | Dicotyledonous and Monocotyledon<br>F. VAN ENGELEN et al., "pBINPI  |   |                                       |               |             |                  |          |              |  |
| ₩                   | Transgenic Research, 1995, Vol. 4,  |   | oveu plant tr                         | anstorma      | uon vect    | or pased on      | PRINI    | . У,         |  |
| xaminer /El         | lizabeth Mcelwain/  | рр. 200-250.  |                                       | Date Cor      | sidered     | 06/17/20         | 010      |              |  |
|                     |   |   | ,                                     | 1.14000       | 500 1       |                  |          |              |  |
|                     | reference considered, whether or not citat<br>nformance and not considered. Include c                     |   |                                       |               |             |                  | gn cita  | non if       |  |

Receipt date: 05/15/2007

| INFORM                                |  | Attorney Docket No.:<br>47236-0009 |                               |                  |                         | Serial No.:<br>10/584,082     |         |          |  |
|---------------------------------------|--|------------------------------------|-------------------------------|------------------|-------------------------|-------------------------------|---------|----------|--|
|                                       | se several sheets if necessary)  | Applican                           | Applicant<br>Kanji OHYAMA     |                  |                         |                               |         |          |  |
|                                       | PTO Form 1449  | Filing Da                          | Filing Date:<br>June 22, 2006 |                  |                         | Group Art Unit:<br>Unassigned |         |          |  |
|                                       | U.S. P.  | ATENT DOCUM                        |                               |                  | Onu                     | ыдпец                         |         | -        |  |
| *Examiner                             | Document   | T                                  |                               |                  |                         | Sub                           | 1       |          |  |
| Initial                               | Number   | Date                               | Date Nam                      |                  | Class                   | Class                         | Filin   | g Date   |  |
|                                       |  |                                    |                               |                  |                         |                               |         |          |  |
|                                       |  |                                    |                               |                  |                         |                               |         |          |  |
|                                       |  | 1                                  |                               |                  |                         |                               |         |          |  |
|                                       |  |                                    |                               |                  |                         |                               |         |          |  |
|                                       |  |                                    |                               |                  |                         |                               |         |          |  |
|                                       |  |                                    |                               |                  |                         |                               |         |          |  |
|                                       |  |                                    |                               |                  |                         |                               |         |          |  |
|                                       |  |                                    |                               |                  |                         |                               |         |          |  |
|                                       |  |                                    |                               |                  |                         |                               |         |          |  |
|                                       |  | <u> </u>                           |                               |                  |                         |                               |         |          |  |
|                                       | FOREIGN  | N PATENT DOC                       | UMENTS                        |                  |                         |                               |         |          |  |
|                                       | Document   | _                                  | _                             |                  | Sub                     |                               | nslati  |          |  |
|                                       | Number   | Date                               | Country                       | Class            | Class                   | Class YI                      |         | ES NO    |  |
|                                       |  | -                                  |                               |                  |                         |                               |         | _        |  |
|                                       |  |                                    |                               |                  |                         |                               |         |          |  |
|                                       |  |                                    |                               |                  |                         |                               |         |          |  |
|                                       |  |                                    |                               |                  |                         |                               |         |          |  |
|                                       |  |                                    |                               |                  |                         |                               |         |          |  |
|                                       |  |                                    |                               |                  |                         |                               |         | L        |  |
|                                       | the author (in CAPITAL LETTERS)  |                                    | (when app                     |                  |                         |                               |         |          |  |
| journal, serial, syr                  | nposium, catalog, etc.) date, page(s),   | volume-issue num                   | ber(s), publ                  | isher, city      | and/or co               | untry whe                     | re pub  | lished.) |  |
| /E.M./                                | Y. TANAKA et al., "Molecular<br>reductase Gene," Plant Cell Phy  | Cloning and Cha                    | racterization                 | n of <i>Rosa</i> | <i>hybrida</i> D<br>021 | ihydroflav                    | onol 4  | -        |  |
|                                       | F. BRUGLIERA et al., "Isolation  | on and characteriz                 | ation of a c                  | DNA clor         | e correspo              | nding to t                    | he Rt l | ocus of  |  |
|                                       | F. BRUGLIERA et al., "Isolation and characterization of a cDNA clone corresponding to the Rt locus of Petunia hybrida," The Plant Journal, 1994, Vol. 5, No. 1, pp. 81-92. |                                    |                               |                  |                         |                               |         |          |  |
|                                       | G. LAZO et al., "A DNA Trans   |                                    |                               | <i>opsis</i> Ger | omic Libr               | ary in Agr                    | obacte  | rium,"   |  |
|                                       | Bio/Technology, October 1991   | , Vol. 9, pp. 963-9                | 67.                           |                  |                         |                               |         |          |  |
|                                       | A. ABBAD1 et al., "Biosynthes<br>Oilseeds: Constraints on Their  |                                    |                               |                  |                         |                               |         |          |  |
|                                       | B. Ol et al., "Production of very  |                                    |                               |                  |                         |                               |         |          |  |
|                                       | Nature Biotechnology, June 20  | 04, Vol. 22, No. 6                 | pp. 739-74                    | 5.               | Ü                       |                               |         |          |  |
| V                                     | Search Report issued on Decem  |                                    |                               | CT Appl          | cation PC               | T/JP2004/                     | 01919   | 5        |  |
| , , , , , , , , , , , , , , , , , , , | (previously submitted to Office  | on June 22, 2006                   | )                             | h                |                         |                               |         |          |  |
| Examiner                              | /Elizabeth Mcelwain/   |                                    |                               | Date Cor         |                         | 06/17/2                       |         |          |  |
| Examiner: Initial if                  | reference considered, whether or not<br>onformance and not considered. Inclu   | citation is in confi               | ormance wi                    | th MPEP          | 609; draw               | line throu                    | gh cita | tion if  |  |
| L HOURT CO                            | mormance and not considered. Hield   | ac copy or uns to                  | with Hex                      | · commu          | i ication to            | applicalli.                   |         |          |  |